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ABSTRACT

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Lederberg, Esther M., University of Wisconsin, Madison, Wis.: The mutability of several Lac- mutants of Escherichia coli. -- Mutants of E. coli unable to ferment lactose have been secured as described in the next abstract. Some of these mutants (Lac-) form colonies in which occur small, raised lactose-positive (Lac+) areas. Independent occurrences of Lac- mutants vary in their revertibility. A segregation for mutability was observed among the recombinant prototrophs obtained when an unstable Lac- (Y-87) was crossed with a stable Lac- strain (W-112). A Lac+ papilla was isolated from each of 21 colonies of the most mutable strain, Y-87. Each was crossed with wild type Lac+. Of the 31,000 recombinants examined all but one were Lac+. Therefore, the change from Lac- to Lac+ is probably a reverse mutation. A similar study was initiated with the occasional papillae found in old colonies of the most stable strain, W-112. The strains isolated were slow fermenters (Lac s). Lac+, Lac s, and Lac- recombinants were obtained from crosses with a suitable Lac+. The Lac s cells from W-112 thus carry a "suppressor" gene. A second distinct suppressor leading to full fermentation of lactose has also been found. One slow fermenter isolated from irradiated cultures of Y-87 mutates rapidly to both Lac+ and Lac-. Further studies on the genetic determination of mutability are in progress.